

# DNRC Aquatic Plant Management Grant Projects

## September 2013 Update



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# Executive Summary: 2013 Ongoing Aquatic Invasive Plant Control and Survey Projects

The following three invasive aquatic plants are listed as noxious weeds in Montana. The plants are targeted for management based on their potential impacts to aquatic environments, agriculture, hydropower, and water-based recreation.

Eurasian watermilfoil (*Myriophyllum spicatum*) occurs at five locations in Montana: the lower Jefferson River, upper Missouri River and associated reservoirs (to upper Canyon Ferry Reservoir), Fort Peck Reservoir, lower Clark Fork (Noxon and Cabinet Gorge Reservoirs), and Beaver Lake. Control was initiated on all EWM-infested water bodies in 2011 with follow-up treatments in 2012 and 2013. Control options for EWM in natural riverine systems are limited mainly to hand removal and barriers.

Curly leaf pondweed (*Potamogeton crispus*) is widespread in the Missouri River Watershed from Hebgen Lake downstream to Fort Peck. It is considered a new invader in the upper Flathead River (above Flathead Lake) where control programs were initiated in 2013. The plant is widespread below Flathead Lake and through the lower Clark Fork drainage.

Flowering rush (*Butomus umbellatus*) infests more than 2000 acres in Flathead Lake and downstream waters of the Flathead and Clark Fork drainage into Idaho. The population in Montana is the primary source of infestation in the Columbia River Basin. Flowering rush is a sterile hybrid (does not spread by seed) but very effectively spreads by root fragments. Effective control options for flowering rush are not available at this time; however, research is on-going in Montana and Idaho.

Fragrant water lily (*Nymphaea odorata*) is not listed as a noxious weed in Montana. It is known invasive and is targeted for physical removal in small isolated infestations in western Montana.

## Projects

Full reports on work that has been conducted in 2013 are due in October 2013. The following project updates are preliminary only.



Figure 1: Bottom barriers were used to control EWM near boat dock in Beaver Lake.

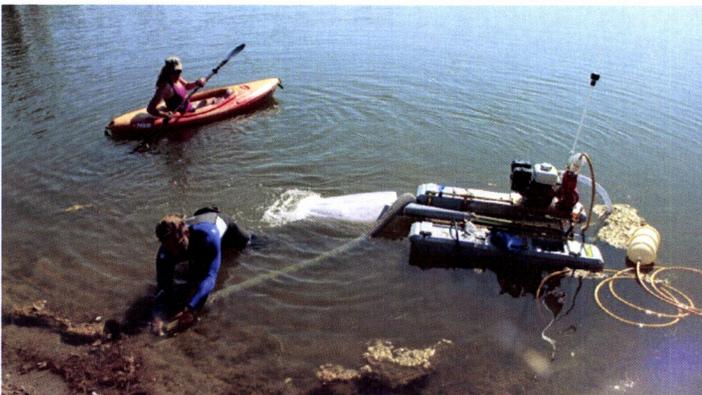


Figure 2: SCUBA divers were used to remove EWM from isolated infestations in Beaver Lake

### Flathead County- Beaver Lake Eurasian Watermilfoil (EWM) Removal Project

(2011/2012/2013): \$19,000 to date. Contact: Flathead Lakers - Robin Steinkraus, 406-883-1346, [lakers@flatheadlakers.org](mailto:lakers@flatheadlakers.org)

EWM was reported in Beaver Lake in October 2011. A control and containment program was initiated immediately after discovery, and an eradication effort began in 2012. ), diver removal of plants (Figure 2), screened barriers to stop movement of the weed to connecting water bodies, and periodic monitoring of the lake and associated water bodies to assure that infestations are found and removed.

Results: In 2012, SCUBA divers dug and removed about 26 pounds of EWM from the lake. In 2013, the entire lake was snorkel surveyed and six pounds of EWM were removed; fragrant water lily, introduced as an ornamental, was removed from the dock area to prevent spread.

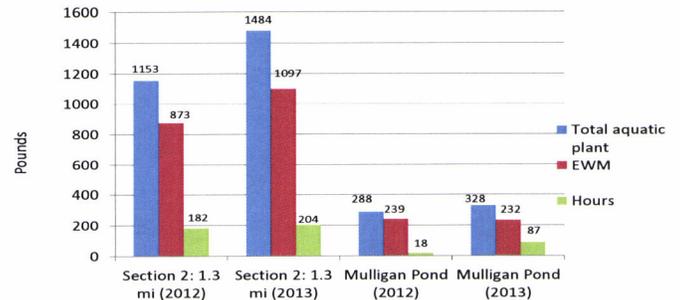
## Broadwater/Jefferson Valley Conservation District - EWM Removal in Jefferson Slough (2012/2013):

\$25,500 to date. Contact: Broadwater Conservation District - Denise Thompson, 406-266-3146 x104, [Denise.Thompson@mt.macdnet.net](mailto:Denise.Thompson@mt.macdnet.net) or Jefferson Valley Conservation District - Kris Hugulet, 406-287-7875, [jvmh57@qwestoffice.net](mailto:jvmh57@qwestoffice.net) and Celestine Duncan, field coordinator 406-443-1469 [weeds1@mt.net](mailto:weeds1@mt.net):

The uppermost known infestation of EWM in the Missouri River headwaters is located in Jefferson Slough near Whitehall. The project includes characterization of the slough, control of uppermost EWM infestations within the slough, and public education/outreach.

**Results:** Crews hand pulled 1,112 pounds of EWM from the upper 1.3 miles of the infestation within the slough and associated pond in late July 2012 (Graph). In 2013, crews pulled 1,329 pounds of EWM from this same area - a 20% increase from 2012. Additional survey work was conducted upstream and no additional EWM infestations were discovered. The slough was also characterized at 30 points for flow velocity, sediment depth, channel width, slope, and other field parameters. Gallatin County Weed District and Watershed Corp completed 1.5 miles of aquatic plant survey downstream the main channel from Drouillard Fishing Access Site on the lower Jefferson River. EWM was present throughout the channel with varying densities and in all substrates. Channel flow is heavily influenced by groundwater. An AIS display was developed for fairs, meetings, and other public events.

Worker hours and number of pounds of submersed aquatic plants including EWM removed in Jefferson slough in upper 1.3 miles of the infestation and Mulligan's Pond ( 2012 and 2013)



## Canyon Ferry Wildlife Management Area (2013 -BOR/FWP/Broadwater CD project)

Contact: Broadwater Conservation District - Denise Thompson, 406-266-3146 x104 [Denise.Thompson@mt.macdnet.net](mailto:Denise.Thompson@mt.macdnet.net) .

**Results:** In total, 400 man hours removed 7,175 pounds of EWM from 0.93 miles of the west side canal. In addition to hand pulling EWM, four 10-foot by 12-foot weed bottom barriers were installed and one 12-foot by 100-foot experimental burlap bottom barrier was installed to test effectiveness on controlling EWM. After research, evaluation and environmental assessments are completed, herbicide

application may be a more appropriate EWM control measure within the ditch.

**Toston Reservoir - EWM Removal project (2010/2011/2012/2013):** \$47,500 to date. Contact: DNRC - Alicia Stickney, 406-444-0547; [astickney@mt.gov](mailto:astickney@mt.gov).

EWM was reported in Toston Reservoir in 2010. Manual removal with divers (Figure 3) and installation of bottom barriers has been on-going annually since fall 2010.

**Results:** About 1,300 pounds of aquatic plant material was removed in 2010. Although there was an increase in total biomass removed in 2011, the amount of EWM removed declined from 2011 to 2012 on most sites that had been pulled for three consecutive years. Total amount of EWM removed was 1,542 pounds in 2011, 1,547 pounds in 2012 and 558 pounds in 2013.



Figure 3: ACE Diving removing EWM from Toston Reservoir

## Fort Peck EWM Demonstration and Control Project

(2012/2013): \$32,330 to date. Contact: U. S. Army Corps of Engineers - Patricia Gilbert, [Patricia.L.Gilbert@usace.army.mil](mailto:Patricia.L.Gilbert@usace.army.mil) or Valley County Weed District - Rick Stellflug, 406-228-6237.

The project included an aquatic plant survey on the lower Missouri and in Fort Peck Lake, and funding to help support herbicide demonstration plots on Fort Peck.

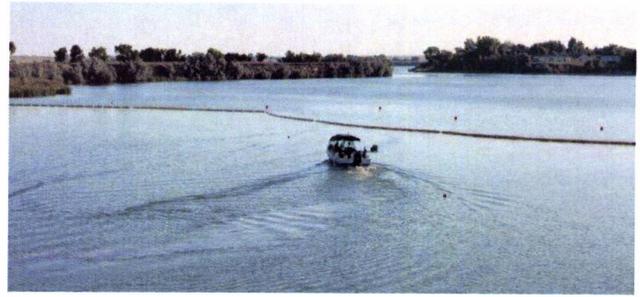


Figure 4: Herbicide treatment on EWM infestations in the dredge cuts.

**Results:** Herbicide treatments were applied to 27 acres by Clean Lakes Inc. in 2012 (Figure 4). Additional surveys are planned from September 9th - October 25, 2013. A 13+ foot reservoir drawdown and winter exposure 2012/13 caused a significant decline in EWM infestations.

## Sanders County Aquatic Invasive Plant Task Force – EWM control on Noxon and Cabinet Gorge Reservoirs

(2010/2011/2012/2013/2014): About \$290,000 current expended on \$300,000 RDGP funds; an additional \$125,000 committed for 2014. Contact: Sanders County Aquatic Plant Task Force - John Halpop, 406-827-6934 [jhalpop@montana.edu](mailto:jhalpop@montana.edu).

EWM was first reported in Montana at Noxon Reservoir in 2007. A survey of the lower Clark Fork reservoirs reported about 400 acres infested with EWM, 700 acres with curlyleaf pondweed, and 100 acres of flowering rush. **Results:** Bottom barriers, diver-dredge removal, and herbicides are being used for control. Clean Lakes Inc. used Littline equipment (Figure 5 and 6) to treat 172 acres of EWM in 2012, and 182 acres in 2013. Herbicide treatments included endothall, triclopyr, and diquat, applied alone and in combination, depending on site conditions and water flow. Herbicide prescriptions for the various sites were based on preliminary studies conducted in the reservoir in 2009 and 2010. Pre- and post-treatment aquatic plant sampling (Figure 7) was completed on Noxon Reservoir to quantify results of herbicide treatments on native and invasive aquatic plants.



Figure 5: Clean Lakes Inc during herbicide application with Littline system.



Figure 6. Close-up of Littline System.

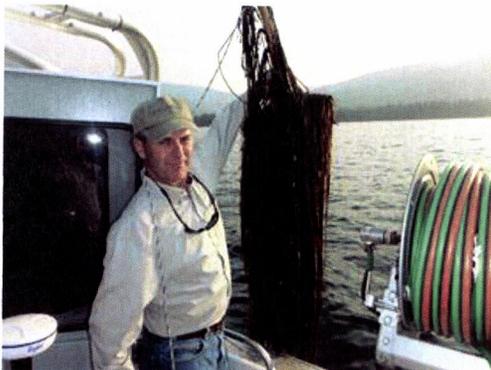


Figure 7: Pre-and post- plant sampling was used to determine level of aquatic plant control with herbicides.

Plant data collected six and 52 weeks post-treatment indicated good to excellent (80 to 95%) control of EWM on the majority of treatment sites. The project goal is to reduce EWM to a maintenance level.



**Flathead Basin Surveys, Curlyleaf Pondweed (CLP) Project (Flathead Lake and River), and Hungry Horse Reservoir Flowering Rush (2013/2014):** \$58,600. Contact: Lake County - Susan Brueggeman, 406-883-7236, [sbrueggeman@lakemt.gov](mailto:sbrueggeman@lakemt.gov)

The project in 2013 includes CLP removal in bays within Flathead Lake, and portions of Flathead River (upstream of Flathead Lake) to determine effectiveness of diver-dredge removal on CLP infestations. Additional survey work is planned in the Flathead Basin for water bodies that have not been previously surveyed for AIS. The new infestation of flowering rush in Hungry Horse Reservoir reported in 2012 was not verified. Hungry Horse Reservoir has no aquatic invasive species.

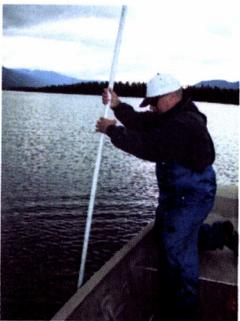
**Results:** Contractors were hired to remove CLP from portions of Flathead Lake and Flathead River in 2013. Additional survey and removal work is ongoing in Flathead Lake and Flathead River.

**Flowering Rush Project - Flathead Lake and River (2013/2014):** \$28,500. Contact: Salish Kootenai College – Virgil Dupuis, 406-275-4899, [virgil\\_dupuis@skc.edu](mailto:virgil_dupuis@skc.edu).

Project includes bare-ground herbicide application research study to determine effectiveness of treatments for flowering rush control (scheduled to begin 2014).

**Results:** Salish Kootenai College has completed the field work for most of the invasive plant inventory from Perma to Thompson Falls Reservoir. Flowering rush and curlyleaf pondweed were found throughout the stretches. No EWM was found through any sections surveyed to date. The boat launch and any additional miles of river will be done next season.

The Clark Fork is highly braided with large islands in portions that doubles the inventory area for significant stretches of the river.



**AIS Monitoring and Vegetation Survey Missoula County Lakes and Rivers**

**(2011/2012/2013):** \$28,730 to date. Contact: Missoula County – Lindsey Bona-Eggeman, 406-258-4219, [lbona@missoulaeduplace.org](mailto:lbona@missoulaeduplace.org).

The project included survey of many lakes in the Big Blackfoot watershed, the Chain of Lakes region in the Clearwater River watershed, and portions of the Swan River watershed in 2011 and 2012. In 2013, Missoula County completed surveys in eight high-risk lakes: Seeley, Salmon, Placid, Alva, Inez, Brown's, Upsata, and Georgetown.

**Results:** No AIS were discovered.

Environmental DNA (eDNA) sampling was also conducted to determine sensitivity of this technique for detecting EWM. eDNA samples have been collected from Seeley, Alva and Georgetown Lakes, and above and below known infestations in Jefferson slough. Purpose is to determine sensitivity of method for detecting EWM in lakes and flowing water systems.

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**Statewide AIS Monitoring and Vegetation Surveys (2011/2012):** \$285,000 to date. Contact: DNRC - Alicia Stickney, 406-444-0547, [astickney@mt.gov](mailto:astickney@mt.gov).

In 2011 and 2012, 118 lakes or reservoirs and 15 rivers within five major watersheds in Montana were surveyed in detail for aquatic invasive plants. Results of the surveys found that about 24 percent of lakes/reservoirs and 66 percent of rivers were found positive for at least one submersed aquatic invasive plant. The following tables summarize rivers, lakes, and reservoirs surveyed, and water bodies that were found positive for aquatic invasive plants in Montana.

**Table 1: Rivers and river segments that have been surveyed in Montana 2011 and 2012**

Beaverhead River  
Big Hole River (Notch Bottom Fishing Access Site to Pennington Bridge Fishing Access Site)  
Big Hole River  
Bitterroot River (6 points)  
Bitterroot River (river mile 41 to river mile 21)  
Blackfoot River (15 points)  
Clark Fork River (10 points)  
Clark Fork River Fishing Access Site  
Flathead River: 10 miles upstream from Flathead Lake  
Flathead River (river mile 66 to river mile 36)  
Gallatin River  
Jefferson River  
Jefferson Slough  
Madison River above Ennis Reservoir  
Madison River below Ennis Reservoir (portions)  
Missouri River (Three Forks to Toston Reservoir)  
Missouri River (Toston Dam to Canyon Ferry)  
Missouri River (Holter Lake to Great Falls)  
Missouri River (Fort Benton to Loma)  
Missouri (Coal Banks to Little Sandy; James Kipp)  
Missouri River (Judith Landing to Holmes Council)  
Missouri River (Fort Peck Dam to Frazer Rapids)  
Red Rock River (above and below lakes)  
Roe River  
Ruby River (above reservoir)  
Ruby River (below reservoir)  
Yellowstone River (portions Livingston to Glendive)

**Table 2: Lakes and reservoirs in Montana surveyed for aquatic invasive plants**

<b>County</b>	<b>Lake or Reservoir</b>		
Beaverhead	Clark Canyon Elk	Lima Poindexter Slough Upper and Lower Red Rock	
Big Horn	Tongue River		
Broadwater	Canyon Ferry Cottonwood Slough and associated ponds	Toston	
Carbon	Cooney		
Deer Lodge	Warm Springs Kids Pond		
Flathead	Ashley Beaver Blanchard Dollar Echo Egan Slough Flathead Lake	Foy Lake Hungry Horse Lake Five Lion Little Bitterroot Lower Stillwater McDonald	McGregor Stillwater Sylvia Tally Whitefish
Gallatin	Gallatin Pond	Hyalite	Hebgen
Granite	East Fork Echo Georgetown	Lower Willow Creek Moose	
Hill	Bear Paw	Fresno	
Jefferson	Jefferson Slough		
Lewis & Clark	Hauser Holding Reservoir Holter	Holter Helena	Willow Creek Canyon Ferry
Lake	Lower Crow Horseshoe Kicking Horse	Mary Ronan Loon Ninepipe	Pablo Swan Van
Liberty	Elwell		
Lincoln	Dickey Glen	Savage Spar	Thompson Chain Lakes
Madison	Cataract Cliff	Ennis Ruby	Wade Willow Cr
Meagher	Newlan		
Missoula	Alva Beavertail Hill Pond Big Sky Blanchard Brown Cottonwood Elbow Elsina	Frenchtown Pond Harpers Hidden Holland Inez Lindberg Lolo Marshall	Pierce Placid Rainy Salmon Seeley Summit Tuppers
Park	Dailey		
Philips	Nelson		
Pondera	Francis		
Powell	Conley Coopers	Mud Nevada	Tin Cup Upsata
Ravalli	Como Painted Rocks	Painted Rocks	
Sanders	Cabinet Gorge	Thompson Falls	Noxon
Teton	Bynum	Gibson	Pishkun
Valley	Fort Peck		

**Table 3: Lakes and reservoirs infested with aquatic invasive plants in Montana<sup>1</sup>**

<b>Lakes/Reservoirs</b>	<b>County</b>	<b>Aquatic Invasive Plant</b>
Beaver Lake	Flathead	EWM, Fragrant Water Lily
Blanchard Lake	Flathead	Fragrant Water Lily
Cabinet Gorge Reservoir	Sanders	EWM, CLP, FR
Echo Lake	Granite	Fragrant Water Lily
Ennis Lake	Madison	CLP
Flathead Lake (northern half)	Lake/Flathead	FR, CLP
Flathead Lake (flowering rush survey)	Flathead	FR
Flathead Lake (portions-southern)	Flathead	FR
Fort Peck Dredge Cuts (Below Ft Peck Dam)	Valley	EWM
Fort Peck Reservoir (portions)	Valley others	EWM
Fort Peck Trout Pond	Valley	CLP
Gallatin Pond	Gallatin	CLP
Hauser Lake	Lewis & Clark	CLP
Hebgen Reservoir	Gallatin	CLP
Helena	L&C	CLP
Helena Holding Reservoir	L&C	CLP
Hidden Lake	Missoula	Fragrant Water Lily
Holter (high risk sites)	L&C	CLP
Horseshoe Lake	Lake	Fragrant Water Lily
Inez	Missoula	Fragrant Water Lily
Kicking Horse Reservoir	Lake	CLP
Loon Lake	Lake	Fragrant Water Lily
Ninepipe Reservoir	Lake	CLP
Noxon Reservoir	Sanders	EWM, CLP, FR
Pablo Reservoir	Lake	CLP, FR
Placid Lake	Missoula	Fragrant Water Lily
Salmon Lake	Missoula	Fragrant Water Lily
Seely Lake	Missoula	Fragrant Water Lily
Thompson Falls Reservoir	Sanders	CLP, FR
Toston Reservoir	Broadwater	EWM, CLP
Upsata Lake	Powell	Fragrant Water Lily

<sup>1</sup> A total of 118 lakes or reservoirs have been surveyed with 28 infested for one or more submersed aquatic invasive plant (24%). Sloughs were considered part of the river.

CLP = Curly Leaf Pondweed, EWM = Eurasian Watermilfoil, FR = Flowering Rush

**Table 4: Rivers infested with aquatic invasive plants in Montana<sup>2</sup>**

<b>River or River Segment</b>	<b>County</b>	<b>Aquatic Invasive Plant</b>
Jefferson (lower)	Jefferson	EWM, CLP
Jefferson Slough	Jefferson	EWM, CLP
Missouri (Three-Forks to Toston Reservoir)	Broadwater	EWM, CLP
Missouri River (Toston Dam to Canyon Ferry)	Broadwater/ Gallatin	EWM, CLP
Missouri (Ft Peck Dam to Frazer Rapids)		EWM
Bitterroot River (6 points)		CLP
Bitterroot River (river mile 41 to river mile 21)	Ravalli	CLP
Clark Fork River (10 points)	Missoula	CLP
Clark Fork River Fish Access Site	Powell/Missoula	CLP
Clark Fork River	Sanders	CLP, FR
Cottonwood slough/ditch/pond/ deposition area where Missouri enters Canyon Ferry (considered part of Missouri)	Broadwater	EWM, CLP
Flathead River: 10 miles upstream from lake; FR at Fennon Slough but not observed above	Flathead	CLP, FR
Flathead River (river mile 66 to river mile 36) about 10 miles below Kerr Dam	Lake	CLP starts at river mile 45, FR
Gallatin	Gallatin	CLP
Madison	Madison	CLP
Madison (below Ennis Reservoir-portions)	Madison	CLP
Missouri (Fort Benton to Loma)	Chouteau	CLP
Missouri (Judith Landing to Holmes Council)	Chouteau	CLP
Roe	Cascade	CLP

<sup>2</sup> A total of 15 rivers or sections of rivers have been survey with 10 positive for submersed aquatic invasive plants (66%). Jefferson slough is considered separate from the main Jefferson. Cottonwood slough is considered part of the Missouri. CLP = Curly Leaf Pondweed, EWM = Eurasian Watermilfoil, FR = Flowering Rush